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Lucky should be an article of the most devout faith, even the stoutest of American opponents was willing to concede the voyage of Leif's long ship, the only disagreement was upon the precise goal in America which he reached. But Dr. Nansen, so proud of the history of his great forefathers that he will tolerate not the slightest taint of fiction to draw from their proper credit, destroys the discovery of Wineland with consummate analysis of saga and other legend. After his study we need no longer concern ourselves with debate as to Leif Ericson's landfall. It was nowhere on the American main, Wineland the Good is nowhere on this earth. It is the port of Cloudecockooland, it is filmy myth. The argument to this destruction of Wineland is slowly elaborated in these volumes. Not an item in the saga account is neglected, each least particular in the narrative is carried back to its source in the mass of folk mythology and it is shown how each such item came into the possession of the northern makers of sagas. It is a powerful case of analysis. Not a wisp of Wineland is left to perplex our northeastern geography. Even the wild men of Wineland have had to go, the Skraelings; we shall miss the Skraelings. There was something attractive about those superhuman savages, something that made the flesh creep even to read of them, all tending to set in higher glory this Leif the Lucky.

WILLIAM CHURCHILL.

GENERAL

Meteorology. A Text-Book on the Weather, the Causes of its Changes, and Weather Forecasting for the Student and General Reader. By Willis Isbister Milham. xvi and 549 pp. Maps, ills., index. The Macmillan Co., New York, 1912. \$4.50. 9 x 6.

We have here the results of Professor Milham's experience in teaching during the past eight years at Williams College, supplemented by study at the Weather Bureau in Washington, where he went to familiarize himself with the Government meteorological work. This combination of college teaching and of a knowledge of practical meteorological work has resulted, as might easily have been predicted in the case of the author of this book, in the production of an excellent text, well-arranged, up to date, and very strong on the bibliographic side.

There has been increasing need of a text-book of meteorology which should present the most recent developments of the science, and which should, at the same time, give the reader and student a well-selected list of references to the literature, which has been growing with such rapidity that even most experts can no longer hope to keep up with it. Professor W. M. Davis's "Elementary Meteorology" is now fifteen years old, and is already behind the times in several respects, although it has not lost the commanding position which it has held by reason of the remarkable clearness of its presentation, the logical development of its treatment, and the emphasis which it lays upon the correlation of the different meteorological phenomena. Its importance is clearly shown by the fact that Professor Milham is much indebted to it in his own work. Those who know the "Elementary Meteorology" well will recognize the points of similarity. We say this without meaning in any way to detract from the importance of Professor Milham's own book. To our mind, no writer of a text-book of meteorology, intended for purposes of instruction, would do well to attempt to cut himself entirely loose from the general plan marked out by Professor Davis.

Professor Milham has given us exactly what we have been needing for years past, and we commend his Meteorology to the "general reader" and to the teacher and student. Systematically arranged, with summaries at the beginning of each chapter, marginal headings, questions, topics for investigation and bibliographies, the present status of the science is clearly summarized and the reader is guided to such further study as he may have the opportunity to make. Those who have themselves endeavored to keep up with the recent advances in meteorology will appreciate the wide range of Professor Milham's reading. His text is unusually complete; in fact, the body of the material is so solid that in some places it might almost seem to be almost too solid. But the

mistake, if there be a mistake, is surely on the right side. A solid text is far better than a slim one, in such a book. Probably few of his readers will find it necessary to go beyond his text for the information which they are seeking. And this is a distinct advantage in the case of a text-book which we hope, and believe, will have extended use among teachers.

Professor Milham's desire to present the current views of meteorologists leads him in some cases to outline several theories (as, *e. g.*, in the case of the theories of extra-tropical cyclones). He gives the arguments *pro* and *con* very clearly and succinctly, but the student may perhaps wish that something more definite had been given him. Most students of elementary science do not like to argue things out for themselves. What they want is a definite statement which they may take as authoritative. This is not a very encouraging frame of mind, but it is very common. Again, in a few cases, our author does not seem to us to have given, with sufficient clearness, the generally recognized explanation of the phenomenon which he is discussing, *e. g.*, in connection with the relation between isobaric surfaces and isobaric lines, the diurnal variation in wind direction, and the formation of the tornado funnel cloud. Yet we have no hesitation in saying that Professor Milham has, on the whole, avoided giving too great detail on the one hand, and too incomplete an outline on the other. The discussion of the defective effect of the earth's rotation and of its application to the circumpolar whirl, and of the general circulation (surface and upper), will perhaps strike others besides the reviewer as being among the less effective portions of the text, while the sections on weather prediction are admirably done. There is an excellent, clear, and complete account of weather forecasting, which will be found extremely useful. A generous supply of charts, including several carefully selected illustrative weather maps, adds greatly to the value of the book. A few of the illustrations are not always as clear as could be wished, as, for example, the figure of a thunderstorm (p. 324), of the distribution of the meteorological elements around tropical and extra-tropical cyclones, and around anticyclones (pp. 268, 284, 295).

The volume itself is a singularly clear and effective presentation of the present status of meteorological science, in a form which renders it extremely useful for teaching. We feel sure that Professor Milham has given us a text which will contribute greatly to the advance of meteorological knowledge in this country.

R. DEC. WARD.

The Effect of Topography and Isostatic Compensation upon the Intensity of Gravity. By John F. Hayford and William Bowie. Special Publication No. 10, Coast and Geodetic Survey, 1912. 132 pp. Maps, ills., index. 11½ x 9.

The introduction of isostasy in the determination of the figure and size of the earth from observed deflections of the vertical resulted in a marked increase in the accuracy of the values deduced. It was logical that isostasy should be considered in the reduction of gravity observations in order that a corresponding increase in accuracy of the shape of the earth might be obtained from these data.

A preliminary report on the reduction of fifty-six gravity stations in the United States, by the new method, was made to the International Geodetic Association at London and Cambridge in 1909 by Hayford. The present publication is a complete report on the reduction of eighty-nine gravity stations in the United States.

By the new method a correction is applied at each station for the attraction of the topography of the whole earth and also a correction for the isostatic compensation of the topography in addition to the correction for the height of the station above sea-level. The compensation is assumed to be complete and uniformly distributed from the surface to a depth of 113.7 kilometers. This was the most probable limiting depth as determined by the first investigation of the figure of the earth and isostasy from measurements in the United States. The better value of 120 kilometers, obtained from the second investigation of the figure of the earth and isostasy, was not available at the time the tables were computed for the gravity reductions.

The methods used in applying the effect of the topography and its compensation are fully described and the necessary working tables are given. In